IEE PROCEEDINGS

Circuits, Devices and Systems

Vol. 147, 2000

Published by
The IEE, Savoy Place, London WC2R 0BL, United Kingdom
Publishing Department: Michael Faraday House, Six Hills Way, Stevenage, Herts. SG1 2AY, United Kingdom

IEE Proceedings

CIRCUITS, DEVICES AND SYSTEMS

The Institution of Electrical Engineers, Savoy Place, London WC2R 0BL, United Kingdom
Publishing Department: Michael Faraday House, Six Hills Way, Stevenage, Herts. SG1 2AY, United Kingdom

Volume 147 2000 UK ISSN 1350–2409

HONORARY EDITORS

Dr. P. Groeneveld (*Magma Design Automation*)
Prof. A. K. Ray (*Sheffield Hallam University*)

Pages in issues of *IEE Proc.-Circuits Devices Syst.*, 2000

Pages	Issue No.	Date
1–92	1	February
93–152	2	April
153–200	3	June
201–264	4	August
265–312	5	October
313–368	6	December

This publication is copyright under the Berne Convention and the Universal Copyright Convention. All rights reserved. Apart from any copying under the UK Copyright, Designs and Patents Act 1988, Part 1, Section 38, whereby a single copy of this article may be supplied, under certain conditions, for the purposes of research or private study, by a library of a class prescribed by The Copyright (Librarians and Archivists) (Copying of Copyright Material) Regulations 1989: SI 1989/1212, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission of the copyright owners. Permission is, however, not required to copy abstracts of individual contributions on condition that a full reference to the source is shown.

Authorisation to photocopy items for internal or personal use, or for the internal or personal use of specific clients, is granted by the Institution of Electrical Engineers for libraries and other users registered with the Copyright Clearance Center Transactional Reporting Service, provided that the base fee of $20.00 per copy is paid directly to the Copyright Clearance Center, Inc., 222, Rosewood Drive, Danvers, MA 01923, USA (1350–2409/00 $20.00). This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale.

Multiple copying of the content of this publication without permission is always illegal.

The IEE is not as a body responsible for the opinions expressed by individual authors.
The IEE is a member of the Association of Learned & Professional Society Publishers.

©2000: The Institution of Electrical Engineers

Chief Executive and Secretary of the IEE: Alf Roberts BSc PhD CEng FIEE FInstP
Managing Editor: Gill Wheeler

Printed by: Black Bear Press Limited, Cambridge, United Kingdom

Index

IEE Proceedings
Circuits, Devices and Systems

Vol. 147, 2000

Author Index

A

Acosta, A.J. p107
Aguilar-Torrentera, J. p325
Ahmadi, M. p237
Al-Hashimi, B.M. p257
Alpaydin, G. p243
Anagnostopoulos, A.N. p291

B

Balkir, S. p243
Bellido-Diaz, M.J. p107
Bhat, A.K.S. p146
Brown, A.D. p211
Bull, D.R. p303

C

Carter, D.R.H. p356
Carusone, A. p82
Cenys, A. p291
Chakrabarti, P. p133
Chan, K.-L. p331
Chan, S.-P. p175
Chang, C.-H. p201
Cherry, E.M. p334
Chiang, D.H. p19
Chung, Y. p219
Cocorullo, G. p347
Corral, C.A. p189
Corsonello, P. p347

D

Dagless, E. p303
Dasgupta, S. p133
Djahanshahi, H. p237
Do, M.-A. p331
Dudek, F. p257
Dundar, G. p243

E

Erten, G. p243

F

Falkowski, B.J. p201
Filoramo, P. p196
Finkelstein, E. p171
Fiocchi, C. p100
Frey, D. p65

G

Gatti, U. p100
Giorgio, A. p139
Giustolisi, G. p196
Glinianowicz, J. p13
Grimbleby, J.B. p319
Groenewold, G. p28
Guo, J.-I. p276

H

Harris, N.J. p153
Hawksford, M.O.J. p153
Huang, M. p175
Huertas, J.L. p107
Hughes, J.B. p73

J

Jakusz, J. p13
Jardon-Aguilar, H. p325
Johns, D.A. p82
Juan-Chico, J. p107
Jullien, G.A. p237

K

Karsilayan, A.I. p57
Kazmierski, T.J. p211, p265
Khoo, G.F.W. p356
Kwok, H.L. p125
Kwok, R. p175

L

Li, D. p49
Lindquist, C.S. p189
Liu, S.-I. p158
Liu, Y.X. p165
Looby, C.A. p93
Lou, H.-L. p229
Lyden, C. p93

M

Ma, J.-G. p331
Macek, S. p297
Mack, R.J. p313
Maloberti, F. p100
Manzano, M.A. p183
Massara, R.E. p313
Masud, S. p293
McCanny, J.V. p293
McMahon, R.A. p356
Miller, W.C. p237
Mishra, S.M. p283, p363
Moniri, M. p257
Moschytz, G.S. p35
Mykolaitis, G. p291

N

Namajunas, A. p291
Ndjountche, T. p250
Nishizawa, J. p165
Novak, F. p297

O

Oyama, Y. p165

P

Palmisano, G. p196
Palumbo, G. p196
Passaro, V.M.N. p139
Payne, A. p42
Pedram, M. p271
Perri, A.G. p139
Perri, S. p347
Plotka, P. p165

R

Redmill, D.W. p303
Rofail, S.S. p283, p363
Ruiz, G.A. p183

S

Sanchez-Sinencio, E. p3
Schaumann, R. p19, p57
Schmid, H.P. p35
Shahidul Hassan, M.M. p129
Silva-Martinez, J. p3
Sun, Y. p13
Sundberg, C.-E.W. p229
Sung, G.-M. p158
Suto, K. p165
Szczepanski, S. p13

T

Tamasevicius, A. p291
Thanachayanont, A. p42
Tseng, W.-D. p119
Tsividis, Y. p49

U

Unbehauen, R. p250

V

Valencia, M. p107
Venkatraman, R. p146

W

Wang, K. p119
Wang, L. p271
Wei, J.-F. p158
Weiss, S. p171
Williams, A.C. p211
Wong, S.C. p211
Wu, P.B. p313
Wu, X. p271

Y

Yang, Z.R. p265
Yeo, K.-S. p331, p363
Yeo, K.S. p283

Z

Zarnik, M.S. p297
Zwolinski, M. p265

ACOUSTICS AND ULTRASONICS

Introduction to distributed mode loudspeakers (DML) with first-order behavioural modelling p153

AMPLIFIERS

1.5 V 1.8 GHz bandpass amplifier p331
CMOS transconductance amplifiers, architectures and active filters: a tutorial p3
Feedback amplifier configurations p334
High-frequency two-input CMOS OTA for continuous-time filter applications p13
Op-amp based CMOS field-programmable analogue array p93
Spice model for AM-PM conversion introduced by weakly nonlinear circuits p325

ANALOGUE ELECTRONICS

Active LC filters on silicon p49
Analogue adaptive filters: past and present p82
Analogue discrete-time basic structures for adaptive IIR filters p250
Automatic analogue circuit synthesis using genetic algorithms p319
Current-mode group-delay equalisation using pole-zero mirroring technique p257
Design issues on high-speed high-resolution track-and-holds in BiCMOS technology p100
Design of oscillation-based test structures for active RC filters p297
Future implications of the log domain paradigm p65
Increasing storage capacity in multilevel memory cells by means of communications and signal processing techniques p229
Mixed-mode automatic tuning scheme for high-Q continuous-time filters p57
Non-autonomous second-order chaotic circuit with comparator p291
Op-amp based CMOS field-programmable analogue array p93
Quantitative method for evaluating quality of analogue VLSI layout p313
Sensitivity study and improvements on a nonlinear resistive-type neuron circuit p237
Top-down design of a switched-current video filter p73
Using robust adaptive mixing for statistical fault macromodelling p265

AUDIO EQUIPMENT

Introduction to distributed mode loudspeakers (DML) with first-order behavioural modelling p153

CIRCUIT THEORY AND DESIGN

Analogue adaptive filters: past and present p82
Analogue discrete-time basic structures for adaptive IIR filters p250
Approach to the design of low-voltage SC filters p196
Automatic analogue circuit synthesis using genetic algorithms p319
Current-mode group-delay equalisation using pole-zero mirroring technique p257
DC model of GaAs MESFETs improving circuit simulation p139
Fast time domain simulation of generic resonant mode power converter: mapping the stability region p211
Future implications of the log domain paradigm p65
Genetic synthesis of reduced complexity filters and filter banks using primitive operator directed graphs p303
High-frequency two-input CMOS OTA for continuous-time filter applications p13
LADISPICE-1.2: a nonplanar-drift lateral DMOS transistor model and its application to power IC TCAD p219
Large-signal transient analysis of a soft-switching, two-switch AC-to-DC converter p146
Logical modelling of delay degradation effect in static CMOS gates p107
Multi-code state assignment for low power design p271
Multi-level optimisation approach to switched capacitor filter synthesis p243
Non-autonomous second-order chaotic circuit with comparator p291
Performance comparison of high-order IFLF and cascade analogue integrated lowpass filters p19
Quantitative method for evaluating quality of analogue VLSI layout p313
Rapid design of biorthogonal wavelet transforms p293
Simplified and accurate power-analysis method for deep-submicron ASIC designs p175
Spice model for AM-PM conversion introduced by weakly nonlinear circuits p325
Top-down design of a switched-current video filter p73
Using robust adaptive mixing for statistical fault macromodelling p265

CMOS INTEGRATED CIRCUITS

1.5 V 1.8 GHz bandpass amplifier p331
Active-MOSFET-C single-amplifier biquadratic filters for video frequencies p35
Approach to the design of low-voltage SC filters p196
CMOS floating active inductor and its applications to bandpass filter and oscillator designs p42
CMOS transconductance amplifiers, architectures and active filters: a tutorial p3
Compact 32-bit CMOS adder in multiple-output DCVS logic for self-timed circuits p183
Efficient parallel adder based design for one-dimensional discrete cosine transform p276
Future implications of the log domain paradigm p65
High-frequency two-input CMOS OTA for continuous-time filter applications p13
Logical modelling of delay degradation effect in static CMOS gates p107
Low-power MOSFET-C 120 MHz Bessel allpass filter with extended tuning range p28
Mixed-mode automatic tuning scheme for high-Q continuous-time filters p57
Op-amp based CMOS field-programmable analogue array p93
Performance comparison between static and dynamic CMOS logic implementations of a pipelined square-rooting circuit p347
Performance comparison of high-order IFLF and cascade analogue integrated lowpass filters p19
Sensitivity study and improvements on a nonlinear resistive-type neuron circuit p237
Three types of 2-D lateral magnetoresistive sensors with p^+-implant confinement p158
Top-down design of a switched-current video filter p73

COMPUTER COMMUNICATIONS

Implementation of PCI-based systems using programmable logic p171

DIGITAL ARITHMETIC

Compact 32-bit CMOS adder in multiple-output DCVS logic for self-timed circuits p183
Performance comparison between static and dynamic CMOS logic implementations of a pipelined square-rooting circuit p347

DIGITAL ELECTRONICS

Logical modelling of delay degradation effect in static CMOS gates p107

DIGITAL FILTERS

Genetic synthesis of reduced complexity filters and filter banks using primitive operator directed graphs p303
Rapid design of biorthogonal wavelet transforms p293

ELECTRONIC CIRCUITS

Fault coverage and defect level estimation models for partially testable MCMs p119

ENGINEERING COMPUTING

Automatic analogue circuit synthesis using genetic algorithms p319
DC model of GaAs MESFETs improving circuit simulation p139
Fast time domain simulation of generic resonant mode power converter: mapping the stability region p211
Genetic synthesis of reduced complexity filters and filter banks using primitive operator directed graphs p303
Introduction to distributed mode loudspeakers (DML) with first-order behavioural modelling p153
LADISPICE-1.2: a nonplanar-drift lateral DMOS transistor model and its application to power IC TCAD p219
Logical modelling of delay degradation effect in static CMOS gates p107
Multi-code state assignment for low power design p271
Multi-level optimisation approach to switched capacitor filter synthesis p243
Quantitative method for evaluating quality of analogue VLSI layout p313
Rapid design of biorthogonal wavelet transforms p293
Simplified and accurate power-analysis method for deep-submicron ASIC designs p175
Spice model for AM-PM conversion introduced by weakly nonlinear circuits p325
Top-down design of a switched-current video filter p73
Using robust adaptive mixing for statistical fault macromodelling p265

FILTERS AND FILTERING

Active LC filters on silicon p49
Active-MOSFET-C single-amplifier biquadratic filters for video frequencies p35
Analogue adaptive filters: past and present p82
Analogue discrete-time basic structures for adaptive IIR filters p250
Approach to the design of low-voltage SC filters p196
CMOS floating active inductor and its applications to bandpass filter and oscillator designs p42
CMOS transconductance amplifiers, architectures and active filters: a tutorial p3
Current-mode group-delay equalisation using pole-zero mirroring technique p257
Design of oscillation-based test structures for active RC filters p297
Future implications of the log domain paradigm p65
High-frequency two-input CMOS OTA for continuous-time filter applications p13
Low-power MOSFET-C 120 MHz Bessel allpass filter with extended tuning range p28
Mixed-mode automatic tuning scheme for high-Q continuous-time filters p57
Multi-level optimisation approach to switched capacitor filter synthesis p243
Performance comparison of high-order IFLF and cascade analogue integrated lowpass filters p19
Selectivity of elliptic filters p189
Top-down design of a switched-current video filter p73

FORMAL LOGIC

Generalised k-variable-mixed-polarity Reed-Muller expansions for system of Boolean functions and their minimisation p201

INSULATED GATE FIELD EFFECT TRANSISTORS

Analytical model for current transport in organic thin-film transistors p125
Effect of ionising radiation on the characteristics of a MOSFET p133
LADISPICE-1.2: a nonplanar-drift lateral DMOS transistor model and its application to power IC TCAD p219

INTEGRATED CIRCUITS

Active LC filters on silicon p49
Analytical base transit time of integrated bipolar transistors in quasi-saturation and hard saturation p129
Approach to the design of low-voltage SC filters p196
Design issues on high-speed high-resolution track-and-holds in BiCMOS technology p100
Design of oscillation-based test structures for active RC filters p297
High-frequency two-input CMOS OTA for continuous-time filter applications p13
LADISPICE-1.2: a nonplanar-drift lateral DMOS transistor model and its application to power IC TCAD p219
Performance comparison between static and dynamic CMOS logic implementations of a pipelined square-rooting circuit p347
Performance comparison of high-order IFLF and cascade analogue integrated lowpass filters p19
Quantitative method for evaluating quality of analogue VLSI layout p313
Rapid design of biorthogonal wavelet transforms p293

Sensitivity study and improvements on a nonlinear resistive-type neuron circuit p237
Simplified and accurate power-analysis method for deep-submicron ASIC designs p175
Top-down design of a switched-current video filter p73

LOGIC CIRCUITS

Compact 32-bit CMOS adder in multiple-output DCVS logic for self-timed circuits p183
Design of high performance double edge-triggered flip-flops p283
Efficient parallel adder based design for one-dimensional discrete cosine transform p276
High performance double edge-triggered flip-flop using a merged feedback technique p363
Implementation of PCI-based systems using programmable logic p171
Logical modelling of delay degradation effect in static CMOS gates p107
Multi-code state assignment for low power design p271
Performance comparison between static and dynamic CMOS logic implementations of a pipelined square-rooting circuit p347
Rapid design of biorthogonal wavelet transforms p293

LOGIC DESIGN

Design of high performance double edge-triggered flip-flops p283
Efficient parallel adder based design for one-dimensional discrete cosine transform p276
Generalised k-variable-mixed-polarity Reed-Muller expansions for system of Boolean functions and their minimisation p201
Genetic synthesis of reduced complexity filters and filter banks using primitive operator directed graphs p303
Logical modelling of delay degradation effect in static CMOS gates p107
Multi-code state assignment for low power design p271
Performance comparison between static and dynamic CMOS logic implementations of a pipelined square-rooting circuit p347
Rapid design of biorthogonal wavelet transforms p293

MAGNETIC MATERIALS AND DEVICES

Three types of 2-D lateral magnetoresistive sensors with p$^+$-implant confinement p158

MAGNETIC MEASUREMENT

Three types of 2-D lateral magnetoresistive sensors with p$^+$-implant confinement p158

MATHEMATICAL TECHNIQUES

Generalised k-variable-mixed-polarity Reed-Muller expansions for system of Boolean functions and their minimisation p201
Genetic synthesis of reduced complexity filters and filter banks using primitive operator directed graphs p303
Top-down design of a switched-current video filter p73

MEASUREMENT OF SPECIFIC VARIABLES

Three types of 2-D lateral magnetoresistive sensors with p$^+$-implant confinement p158

MICROPROCESSORS

Rapid design of biorthogonal wavelet transforms p293

MICROWAVE CIRCUITS

1.5 V 1.8 GHz bandpass amplifier p331
Active LC filters on silicon p49

MICROWAVE TECHNOLOGY

Spice model for AM-PM conversion introduced by weakly nonlinear circuits p325

MODULATION

Increasing storage capacity in multilevel memory cells by means of communications and signal processing techniques p229

NEURAL NETWORKS

Sensitivity study and improvements on a nonlinear resistive-type neuron circuit p237

NUMERICAL ANALYSIS

Analogue adaptive filters: past and present p82
Analogue discrete-time basic structures for adaptive IIR filters p250
Efficient parallel adder based design for one-dimensional discrete cosine transform p276
Rapid design of biorthogonal wavelet transforms p293

OPTIMISATION

Automatic analogue circuit synthesis using genetic algorithms p319
Current-mode group-delay equalisation using pole-zero mirroring technique p257
Generalised k-variable-mixed-polarity Reed-Muller expansions for system of Boolean functions and their minimisation p201
Genetic synthesis of reduced complexity filters and filter banks using primitive operator directed graphs p303
LADISPICE-1.2: a nonplanar-drift lateral DMOS transistor model and its application to power IC TCAD p219
Multi-level optimisation approach to switched capacitor filter synthesis p243
Top-down design of a switched-current video filter p73

OPTOELECTRONICS

Impact ionisation in GaAs planar-doped barrier structures grown by molecular layer epitaxy p165

OSCILLATORS

CMOS floating active inductor and its applications to bandpass filter and oscillator designs p42
Non-autonomous second-order chaotic circuit with comparator p291

PARALLEL PROCESSING

Efficient parallel adder based design for one-dimensional discrete cosine transform p276

PERFORMANCE EVALUATION

Efficient parallel adder based design for one-dimensional discrete cosine transform p276

POWER CONVERTERS

Fast time domain simulation of generic resonant mode power converter: mapping the stability region p211
Large-signal transient analysis of a soft-switching, two-switch AC-to-DC converter p146

POWER ELECTRONICS

Comparison of charge pump circuits for half-bridge inverters p356
Fast time domain simulation of generic resonant mode power converter: mapping the stability region p211
LADISPICE-1.2: a nonplanar-drift lateral DMOS transistor model and its application to power IC TCAD p219
Large-signal transient analysis of a soft-switching, two-switch AC-to-DC converter p146

PRODUCTION ENGINEERING

Design of oscillation-based test structures for active RC filters p297

SEMICONDUCTOR DEVICE MODELLING

Analytical base transit time of integrated bipolar transistors in quasi-saturation and hard saturation p129
Analytical model for current transport in organic thin-film transistors p125
DC model of GaAs MESFETs improving circuit simulation p139
Effect of ionising radiation on the characteristics of a MOSFET p133
Impact ionisation in GaAs planar-doped barrier structures grown by molecular layer epitaxy p165
LADISPICE-1.2: a nonplanar-drift lateral DMOS transistor model and its application to power IC TCAD p219

SEMICONDUCTOR DEVICES

Analytical base transit time of integrated bipolar transistors in quasi-saturation and hard saturation p129
DC model of GaAs MESFETs improving circuit simulation p139
Impact ionisation in GaAs planar-doped barrier structures grown by molecular layer epitaxy p165

SEMICONDUCTOR TECHNOLOGY

Effect of ionising radiation on the characteristics of a MOSFET p133

SENSORS AND ACTUATORS

Three types of 2-D lateral magnetoresistive sensors with p$^+$-implant confinement p158

SIGNAL PROCESSING

Efficient parallel adder based design for one-dimensional discrete cosine transform p276
Increasing storage capacity in multilevel memory cells by means of communications and signal processing techniques p229
Three types of 2-D lateral magnetoresistive sensors with p$^+$-implant confinement p158

STATISTICAL ANALYSIS

Using robust adaptive mixing for statistical fault macromodelling p265

SWITCHING THEORY

Multi-code state assignment for low power design p271

THIN FILM GROWTH

Impact ionisation in GaAs planar-doped barrier structures grown by molecular layer epitaxy p165

1.5 V 1.8 GHz bandpass amplifier p331